



DEPARTMENT OF THE ARMY
SOUTH ATLANTIC DIVISION, CORPS OF ENGINEERS
ROOM 9M15, 60 FORSYTH ST., S.W.
ATLANTA, GEORGIA 30303-8801

REPLY TO
ATTENTION OF

CESAD-RBT (1110-2-1150a)

MEMORANDUM FOR COMMANDER, JACKSONVILLE DISTRICT (CESAJ-EN-WW)

SUBJECT: Water Control Plan for Lake Okeechobee and Everglades Agricultural Area – 2008 Lake Okeechobee Interim Regulation Schedule (LORS)

1. Reference memorandum, CESAJ-EN-WW, 17 March 2008, subject as above.
2. This provides written approval of your request for adoption of the 2008 LORS Water Control Plan. A copy of the signed Record of Decision (ROD) on the Final Supplement to the Environmental Impact Statement (EIS) addressing this action is enclosed.
3. Our approval of the subject water control plan is based upon the following critical facts and considerations:
 - a. The Lake Okeechobee Interim Regulation Schedule (LORS) study was initiated to address continued high lake levels, estuary ecosystem conditions, and lake ecology conditions that occurred during the 2003 to 2005 time period. At the forefront of the LORS were the back-to-back historically significant hurricane seasons of 2004 and 2005, the recognized structural integrity issues of Herbert Hoover Dike (HHD), and the potential danger that any hurricane season poses for the people relying upon the protection provided by HHD. Other important considerations were the environmental needs of Lake Okeechobee, the Caloosahatchee Estuary, the St. Lucie Estuary, and the Everglades, including Everglades National Park.
 - b. Herbert Hoover Dike was built in the 1930s to hold back water draining from lands within the watershed. The embankment was originally constructed using primarily hydraulic dredge and dragline techniques; therefore its composition is characterized by a variety of geologic materials. Beneath the embankment, foundation conditions are also non-uniform, with pervious layers of limestone, sand, gravel and shell providing potential paths for under seepage and erosion. Recent analysis, as well as high water events experienced over the last few years, indicates the integrity of the dike is compromised at lake elevations below the SPF authorized level.
 - c. Lake Okeechobee sustained high water levels in 2003, 2004, and 2005. These high water levels have contributed to the poor ecological conditions that have led to the decline in emergent

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and submerged vegetation, which is essential habitat for the lake's sport fish populations. Additionally, regulatory releases from the Lake to the coast continue to impact the ecological health of the estuaries as well.

d. The 2008 LORS incorporates additional and expanded operational flexibility throughout the entire regulation schedule to allow Lake Okeechobee to be managed at lower levels than the current lake regulation schedule. The LORS is effective and proficient at providing for public health and safety, contains flexibility to perform water management operations and when unavoidable, having a more equal distribution of shared adversity than the current regulation schedule.

e. The proposed Water Control Plan features and alternatives addressed in the LORS study were developed and analyzed with extensive stakeholder and public participation as documented in the Final Supplement to the EIS and associated Record of Decision.

4. Point of Contacts for this action are Mr. Christopher Smith, CESAD-RBT, (404) 562-5107 and Ms. Jamie Higgins, CESAD-PDS-P (404) 562-5223.

Encl



JOSEPH P. SCHROEDEL
Brigadier General, USA
Commanding



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REPLY TO
ATTENTION OF

RECORD OF DECISION

**LAKE OKEECHOBEE REGULATION SCHEDULE
LAKE OKEECHOBEE, FLORIDA**

DECISION

The final Supplemental Environmental Impact Statement (SEIS), dated November 2007, for the Lake Okeechobee Regulation Schedule addresses implementation of a new regulation schedule for Lake Okeechobee. The regulation schedule will become part of the Water Control Plan for Lake Okeechobee and the Everglades Agricultural Area, which is a feature of the Central and Southern Florida (C&SF) Project. Based on the final SEIS, the reviews of other Federal, State, and local agencies, Native American Tribes, non-governmental organizations, input from the public, and review by my staff, I find that the plan recommended in the final SEIS referred to as Alternative E, to be technically feasible and economically and environmentally justified, in accordance with environmental statutes, and in the public interest.

The U.S. Army Corps of Engineers (Corps) is responsible for establishing a regulation schedule for Lake Okeechobee. The regulation schedule is a compilation of operating criteria, guidelines, rule curves and specifications that govern the storage and releases from the lake. Under the current regulation schedule, Lake Okeechobee has experienced extended periods of high lake levels due to heavy rainfall and numerous hurricanes. During this time, water managers were faced with regulation schedule constraints that provided minimal flexibility to respond to real time high lake levels, given limited discharge capacity and downstream constraints for the existing outlet structures. To address the current regulation constraints, a new regulation schedule has been developed to respond to high lake levels. Higher than desirable lake levels pose a threat to the structural integrity of the Herbert Hoover Dike (HHD) surrounding the lake, increase the likelihood of prolonged and high volume releases to the estuaries, and degrade Lake Okeechobee's littoral zone habitat. Lake Okeechobee is a multi-purpose project with often competing project purposes including flood control, water supply, navigation, enhancement of fish and wildlife resources, and recreation. The recommended plan attempts to balance these project purposes, but public health and safety, related to concerns with HHD structural integrity, were a dominant factor in the plan formulation process that led to the selection of a new regulation schedule.

The recommended plan, will allow Lake Okeechobee to be managed at a lower level than the current regulation schedule. Managing the lake at a lower level improves public health and safety performance by reducing structural risk to the HHD while rehabilitation efforts are underway, and will provide environmental benefits to Lake Okeechobee and the downstream estuaries. The peak stage for Lake Okeechobee, based on modeling, under the recommended plan was 17.33 ft. NGVD, with a minimum stage of 8.71 ft. NGVD; Lake Okeechobee stage

exceeded 17.25 ft. NGVD on 8 days. Formulating release criteria for Lake Okeechobee to minimize the frequency of lake elevation exceeding 17.25 ft. NGVD was a critical performance measure developed to assess flood protection.

An additional key feature of the recommended plan is that it allows long-term, low-volume releases to the Caloosahatchee and St. Lucie estuaries, and the Water Conservation Areas to the south, with the capability to initiate releases at lower levels than under the current schedule. The low-volume releases, referred to as pulse releases and base flow releases, are intended to manage lake levels while reducing the potential for future prolonged high-volume releases. The low-volume releases will confer environmental benefits to the estuaries by providing flow to assist in maintaining the appropriate salinity range. Adjustments to the magnitude of specified pulse releases and some higher volume releases, as well as the inclusion of improved climate forecasting indices and more pro-active water management operational criteria, were incorporated into the recommended plan in an effort to provide concurrent benefits to the estuaries and Lake Okeechobee littoral zone while meeting the overall need to balance project objectives.

ALTERNATIVES AND CONSIDERATIONS BALANCED IN MAKING THE DECISION

An interagency, multidisciplinary Project Delivery Team (PDT) participated in formulating, evaluating, refining, and selecting alternatives, which resulted in the recommended plan. All of the alternatives were modeled using the South Florida Water Management Model, a regional modeling tool which utilizes a 36-year climatological period-of-record. Evaluations of the alternatives were made by comparing the modeling results for each alternative (as expressed in performance measure output) with the No Action Alternative. Initial alternative formulation resulted in three alternatives, and the No Action Alternative. In an effort to improve performance of these three alternatives, with respect to the study objectives, eleven alternatives evolved, all of which were variations of the original three alternatives. Of the eleven alternatives, those alternatives that performed far outside the study objectives or performance measure criteria, were either refined to enhance their performance or eliminated from further review.

The final SEIS evaluated five alternatives, all of which would manage Lake Okeechobee at a lower level than the current regulation schedule, and the No Action Alternative. As defined by the study scope, only water management alternatives that did not include changes to the existing physical infrastructure of canals, levees, pumps, or water control structures were considered and evaluated. Each alternative regulation schedule is a variation of water management operational criteria to determine when, where, and how much water will be released from Lake Okeechobee to downstream systems. The final SEIS displays the variation of regulation schedules and associated water storage and release guidance for each evaluated alternative. As described above, elevation 17.25 ft. NGVD was used as a key performance measure for limiting high lake stages to ensure public health and safety and for comparing performance of alternative plans. In addition to the recommended plan (Alternative E), the following alternative regulation schedules were considered:

- No Action Alternative - Under the No Action Alternative, Lake Okeechobee would be managed under the current regulation schedule, Water Supply and Environment (WSE), which includes a planned deviation referred to as the Classification Limit Adjustment approved in 2005. In addition, the No Action Alternative includes operation of temporary forward pumps, which were permitted, installed and operated by the South Florida Water Management District in 2007, allowing for continued water supply deliveries under low lake conditions. Peak stage, as modeled, for Lake Okeechobee under the No Action Alternative was 18.53 ft. NGVD, with a minimum stage of 9.46 ft. NGVD; Lake Okeechobee stage exceeded 17.25 ft. NGVD on 348 days in the period-of-record modeling.

- Alternative A – This alternative was developed from the current regulation schedule. The bottom elevations for the upper three regulatory zones are lowered, resulting in a more proactive schedule to limit potential high water conditions in Lake Okeechobee. As a means to reduce the potential impacts associated with high discharge events to the estuaries, this alternative adds a base flow to the Caloosahatchee River Estuary, and maximum releases to the St. Lucie Estuary have been reduced in certain zones of the schedule. Peak stage, as modeled, for Lake Okeechobee under Alternative A was 17.38 ft. NGVD, with a minimum stage of 8.86 ft. NGVD; Lake Okeechobee stage exceeded 17.25 ft. NGVD on 9 days in the period-of-record modeling.

- Alternative B– This alternative is a modification of Alternative A. It was modified to more fully address potential safety issues with the HHD. Modifications include lowering the top three regulatory zones during the late hurricane season, and the lowering of other regulation lines in an attempt to achieve zero days with the lake stage greater than 17.25 ft. elevation. Peak stage, as modeled, for Lake Okeechobee under Alternative B was 17.21 ft. NGVD, with a minimum stage of 8.84 ft. NGVD; Lake Okeechobee stage did not exceed 17.25 ft. NGVD in the period-of-record modeling.

- Alternative C – This alternative is a modification of Alternative A. Modifications were targeted to improve performance for the Caloosahatchee Estuary. Modifications include lowering the top three regulatory zones during the late hurricane season, a reduction in pulse release magnitude measured from Lake Okeechobee to the Caloosahatchee River, increased base flow releases to the Caloosahatchee Estuary, and the addition of base flow releases to the St. Lucie Estuary. Peak stage, as modeled, for Lake Okeechobee under Alternative C was 17.23 ft. NGVD, with a minimum stage of 8.76 ft. NGVD; Lake Okeechobee stage did not exceed 17.25 ft. NGVD in the period-of-record modeling.

- Alternative D – This alternative is a modification of Alternative A. Modifications were targeted to reduce damaging high flows to the Caloosahatchee Estuary while allowing for a minor increase in the frequency of high stages within Lake Okeechobee. Modifications include the following: decision tree criteria for pulse releases to the Caloosahatchee Estuary are measured at the estuary instead of at Lake Okeechobee; lowering of the pulse release zone to reduce steady high-volume discharges by increasing the opportunity for smaller pulse releases; addition of base flow releases to the St. Lucie Estuary; and raising the bottom of the base flow zone to reduce potential adverse effects to water supply and navigation objectives. Peak stage, as modeled, for Lake Okeechobee under Alternative D was 17.57 ft. NGVD, with a minimum stage

of 8.68 ft. NGVD; Lake Okeechobee stage exceeded 17.25 ft. NGVD on 15 days in the period-of-record modeling.

- **Alternative E (Recommended Plan)** This alternative was developed from Alternative D, with additional changes to incorporate features from Alternative C and to improve performance for the Caloosahatchee Estuary. Lake Okeechobee late season break points were changed from September 30 to November 1 to address the potential of late season hurricanes, and an October 1 breakpoint at 13.0 feet was included for the bottom of the baseflow zone to provide some protection to low lake levels at the end of the wet season. Caloosahatchee Estuary pulse release levels were modified to allow for increased releases below the 2800 cfs threshold, to reduce the occurrence of higher lake levels and the associated higher volume releases. Maximum Caloosahatchee Estuary discharges were reduced from 4500 cfs to 4000 cfs when Lake Okeechobee is within the Intermediate or Low sub-bands of the Operational Band, under specific tributary hydrologic conditions. Peak stage, as modeled, for Lake Okeechobee under Alternative E was 17.33 ft. NGVD, with a minimum stage of 8.71 ft. NGVD; Lake Okeechobee stage exceeded 17.25 ft. NGVD on 8 days in the period-of-record modeling.

MEANS TO AVOID OR MINIMIZE ADVERSE EFFECTS

Federal environmental quality regulations (40 CFR 1505.2) require that an agency identify in the Record of Decision the “environmentally preferred alternative” – that is, the alternative that causes the least adverse effects to the physical and biological environments and best protects, preserves, and enhances historic, cultural, and natural resources. After considering the environmental effects, it is difficult to select one alternative over another as being the most environmentally preferred alternative. All alternatives have positive biological effects since all contain similar emphasis on improving the ecological health of Lake Okeechobee and the estuaries. Since Lake Okeechobee is a multi-purpose project, affecting a wide geographic region, no one alternative would be expected to improve performance across the full range of ecological performance measures. The recommended plan performs well in improving ecological conditions within Lake Okeechobee’s littoral zone by reducing the extent and duration of extreme high water elevation, with concurrent benefits to the estuaries. The recommended plan’s ability to provide low-volume releases will confer environmental benefits to the estuaries by providing flow to assist in maintaining the appropriate salinity range. The recommended plan is the alternative that strikes the most acceptable balance in providing environmental benefits and meeting overall project objectives, and is therefore considered the environmentally preferred alternative.

PUBLIC /AGENCY COMMENTS IN THE FINAL SEIS

A draft SEIS containing a preferred alternative was prepared and circulated for public review for 45 days on August 18, 2006. A series of four public meetings were held in 2006 after release of the draft SEIS. A considerable amount of recommendations, feedback and comments were received from the public review process. The majority of the public comments centered on the need for improving the preferred alternative as it related to the Caloosahatchee Estuary performance. Based on consideration of numerous public and agency comments received, a decision was made to complete additional alternative plan formulation and subsequent hydrologic simulation modeling in an attempt to improve performance for the Caloosahatchee Estuary, while still achieving other study objectives. Since additional formulation and modeling

was done, which resulted in a modified array of alternatives, it was necessary to revise the August 2006 draft SEIS instead of finalizing the document. A revised draft SEIS was prepared and released for a 45-day comment period on July 6, 2007. The revised draft SEIS evaluated the alternatives, and incorporated the responses to the numerous comments received on the August 2006 draft SEIS. After release of the revised draft SEIS, the Corps held another series of four public meetings to provide the public an opportunity to comment. All comments received on the revised draft SEIS were responded to in the final SEIS released for public review on November 16, 2007. Although letters of opposition were received on the final SEIS, no substantive new issues were raised.

The recommended plan is largely supported by Federal, State, and local agencies and members of the public. Opposition to the recommended plan is primarily from water supply stakeholders who are concerned that a lower regulation schedule may adversely impact regional water supply deliveries. The Seminole Tribe of Florida (STOF) remains concerned that the lower schedule poses more risk to water supply for the Brighton and Big Cypress reservations. Modeling analysis of the recommended plan indicates that Lake Okeechobee levels have the potential to decline to below 10 ft. NGVD on a more frequent basis when compared to the No Action Alternative. This is a concern for both reservations since they rely on Lake Okeechobee, in part, for water supply, and with the current infrastructure it is difficult to convey water out of the lake below the 10 ft. level. Securing a dependable source of water for the STOF's reservations is of particular importance considering the STOF's surface water rights. The final SEIS discussed various options of short and long-term measures to address the issue at both reservations.

Agriculture stakeholders, as well as the City of Fort Lauderdale, the Lake Worth Drainage District, and the Florida Department of Agriculture and Consumer Services commented on the final SEIS and have expressed the same concern that the recommended plan has the potential for increased risk to water supply. The final SEIS modeling results indicate that the recommended plan resulted in a lower lake stage when compared to the existing regulation schedule. Lower lake stages result from reducing the frequency of high lake stage events. Reducing the frequency of high lake stage events was a key objective for minimizing threats to the HHD structural integrity, while providing environmental benefits to Lake Okeechobee and downstream ecosystems. The Corps will utilize the flexibility within the recommended plan to take advantage of potential opportunities to increase water supply benefits considering all other project purposes, antecedent conditions, and forecast conditions. The operational goal is maintain levels between 12.5 and 15.5. Consistent with the schedule, releases can be adjusted to try to keep levels within this band and to meet ecological and other beneficial use purposes.

While not strictly opposed to the recommended plan, the City of Sanibel, Lee County and PURRE Water Coalition expressed negative comments to the final SEIS. It is their opinion that the recommended plan does not solve the fundamental long-term water quantity and quality problems of the Caloosahatchee Estuary, allegedly caused by releases from Lake Okeechobee. These stakeholders also believe there remain several mitigation measures that the Corps could have considered, such as expanding water quality monitoring and incorporating emergency water storage initiatives. The Corps developed the recommended plan with the intent to improve regulation of lake releases for estuary performance over the current regulation schedule. The final SEIS modeling results do indicate that LORSS will result in more estuarine flows in the

preferred range and less flows in undesirable ranges. The final SEIS also explains that the recommended plan will be an interim schedule, and a new study will begin immediately following completion of this Lake Okeechobee Regulation Schedule Study which will take into consideration upcoming Comprehensive Everglades Restoration Plan (CERP) projects. This study acknowledges the need for CERP projects and greater storage capacity within the system, the need for a structural solution for the HHD, and the need to improve water quality. However, no alternative schedules that incorporated structural modifications were studied as they were outside the scope of the Lake Okeechobee Regulation Schedule Study. The recommended plan identifies an interim solution which helps redress the ongoing public health and safety and environmental concerns in the near term, while balancing all project purposes for Lake Okeechobee, including flood protection, water supply, navigation, enhancement of fish and wildlife resources, and recreation.

The Miccosukee Tribe of Indians remains critical of the final SEIS evaluation and the recommended plan. Miccosukee Tribe concerns, in part, relate to water levels at the reservations and in Water Conservation Area (WCA) 3 (for public health and safety reasons and tree island impacts) and water quality in WCA 3. Water quality, aside from salinity considerations for the estuaries and recognition of the STA-3/4 treatment capacity constraint for Lake Okeechobee releases to WCA-3, could not be addressed by the operational changes considered for the LORSS. The Miccosukee Tribe's comments on the final SEIS raised no substantive new issues, and the Corps believes that the concerns identified in the Miccosukee Tribe's comment letter have been previously addressed in the final SEIS.

COMPLIANCE WITH ENVIRONMENTAL REQUIREMENTS

Within the scope of this regulation schedule change, all practicable means to avoid and/or minimize adverse environmental impacts have been incorporated into the recommended plan. Consultation with the National Marine Fisheries Service and the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act was completed. The Corps determined in consultation with the National Marine Fisheries Service (NMFS) that the action may affect, but is not likely to adversely affect Johnson's seagrass or the small tooth sawfish. The NMFS concurred with the Corps' determination on these two species. The Corps and the U.S. Fish and Wildlife Service (USFWS) formally consulted on the Everglade snail kite, which resulted in a Biological Opinion dated October 15, 2007. Specifically, the USFWS is concerned with the effects of the action on the apple snail population within Lake Okeechobee's littoral zone, and the resulting effects on the snail kite. The apple snail is the primary food source for the snail kite. As required in the terms and conditions of the Biological Opinion, the Corps will implement an apple snail monitoring program within the littoral zone of Lake Okeechobee to measure the effects of the action on the apple snail. The littoral zone marsh of Lake Okeechobee is also designated critical habitat for the snail kite. As a means to measure change in the suitable habitat for the snail kite, the Corps will ensure vegetation data is gathered to determine the effects of the recommended plan on critical habitat, as recommended in the terms and conditions of the Biological Opinion. The USFWS' determination was that effects of LORSS on the snail kite are negligible with regard to the WCAs.


Recommendations from the U.S. Fish and Wildlife Service under the Fish and Wildlife Coordination Act will be considered during operation of the new regulation schedule. Upon

review of the final SEIS, the Florida State Clearinghouse determined by letter dated December 19, 2007 that the recommended plan is consistent with the Florida Coastal Zone Management Program. The State Historical Preservation Officer has indicated by letter dated August 25, 2005 that no significant archaeological or historical resources would be affected within the project area.

SUMMARY

All applicable laws, executive orders, regulations, and local plans were considered in evaluating the alternatives. Based on review of these evaluations, I find that any adverse effects of the recommended plan described in the final SEIS have been avoided and/or minimized to the extent practicable, and I am confident that the plan best meets the overall Federal objectives. The plan is technically sound, economically justified, and in accordance with environmental statutes. I find that the recommended plan, as presented in the final SEIS, is the most feasible solution and represents the course of action that best serves the overall public interest. This Record of Decision completes the National Environmental Policy Act process.

28 April '08
Date



JOSEPH SCHROEDEL
Brigadier General, US Army
Commander, South Atlantic Division